

IN THE SPECIFICATION

Please replace the paragraph at page 54, prenumbered lines 15-25, with the following rewritten paragraph:

Fig. 14 is a block diagram of a configuration of a booster according to a tenth embodiment of the present invention. The booster depicted includes, in the configuration according to the fifth embodiment as shown in Fig. 9, a ~~fuel etc. supply~~ detecting unit 29 that detects whether a fuel or oxygen (air) is supplied to the fuel cell 21, a switching unit 27 provided with a switching element 51 that is connected between the lithium storage cell 23 and the booster circuit 12 and to which a start-up signal from the ~~fuel etc. supply~~ detecting unit 29 and a supply stop signal from the booster circuit 12 are input. Other configurations are the same as or equivalent to those shown in Fig. 9 and the same reference numerals designate those portions.

Please replace the paragraph at page 55, prenumbered lines 1-12, with the following rewritten paragraph:

Referring to Fig. 14, the operation of this booster circuit is explained. In Fig. 14, the ~~fuel etc. supply~~ detecting unit 29 detects that a fuel or oxygen (air) (hereinafter, referred to as “fuel etc.”) is supplied to the fuel cell 21 and outputs a start-up signal. The booster circuit 12 generates a boosted output formed by boosting a low voltage output from the fuel cell 21. The switching unit 27 controls whether to output the start-up energy supplied from the lithium storage cell 23 to the booster circuit 12 based on the start-up signal that is output from the ~~fuel etc. supply~~ detecting unit 29 and the supply stop signal that is output from the booster circuit 12. On the other hand, the output of the booster circuit 12 is fed back to the booster circuit 12 itself, so that the booster circuit 12 can continue its boosting operation.

Please replace the paragraph at page 55, prenumbered lines 13-23, with the following rewritten paragraph:

The ~~fuel etc. supply~~ detecting unit 29 outputs a start-up signal while the fuel etc. is supplied to the fuel cell 21. The start-up signal is output while the fuel etc. is supplied (start-up signal "ON"), and acts in such a manner that the switching element 51 of the switching unit is conducting. On the other hand, the supply stop signal is the boosted output itself of the booster circuit 12 and acts in such a manner that when the boosted output voltage is a predetermined voltage or more (supply stop signal "ON"), the switching element 51 of the switching unit 27 is interrupted while when the boosted output voltage is less than the predetermined voltage (supply stop signal "OFF"), the switching element 51 is conducting.

Please replace the paragraph at page 56, prenumbered line 20, to page 57, prenumbered line 5, with the following rewritten paragraph:

With the booster according to the tenth embodiment, the switching unit to which a low voltage output from the first cell is input controls whether to allow the start-up energy supplied from the second cell to be output to the booster circuit based on the start-up signal output from the ~~fuel etc. supply~~ detecting unit and the supply stop signal that is the boosted output itself, so that the boosted output for operating, for example, a mobile device can be obtained by using the energy of the first cell from which only a low voltage output is available. Also, the start-up energy can be output only when it is necessary to start up the booster circuit, so that it is possible to use the start-up energy efficiently.

Please replace the paragraph at page 57, prenumbered lines 6-12, with the following rewritten paragraph:

The feature of this embodiment, i.e., the configuration in which controls whether to allow the start-up energy supplied from the second cell to be output to the booster circuit are performed based on the start-up signal output from the ~~fuel etc. supply~~ detecting unit and the supply stop signal that is the boosted output itself can be applied to the eighth and ninth embodiments with similar effects as those of the tenth embodiment.

Please replace the paragraph at page 58, prenumbered lines 7-11, with the following rewritten paragraph:

Referring to Fig. 16, the operation of this booster circuit is explained. However, the operation of the ~~fuel etc. supply~~ detecting unit to output a start-up signal and the operation of the fuel cell 21 to supply a low voltage output to the booster 12 are the same as those in the tenth embodiment and description thereof is omitted.

Please replace the paragraph at page 58, prenumbered lines 17-23, with the following rewritten paragraph:

The switching unit 27 controls whether to output the start-up energy supplied from the lithium storage cell 23 to the booster circuit 12 based on the start-up signal output from the ~~fuel etc. supply~~ detecting unit 29. The start-up signal is output is a start-up signal ("ON" signal) for conducting the switching unit 27 while the fuel etc. is being supplied. On this occasion, the energy from the lithium storage cell 23 is output to the selector circuit 25.

Please replace the paragraph at page 59, prenumbered lines 5-18, with the following rewritten paragraph:

With the booster according to the eleventh embodiment, a low voltage output, target to be boosted, is input to the booster circuit from the first cell and the selector circuit, to which both the start-up energy and operation energy are input through the switching unit that operates based on the start-up signal output from the ~~fuel etc. supply~~ detecting unit, outputs either one of the start-up energy and operation energy to the booster circuit. Accordingly, not only the boosted output for operating, for example, a mobile device can be obtained by using the energy of the first cell from which only a low voltage output is available but also a booster with which an increase in production cost due to use of a special cell is prevented and a reduction of cost by using a versatile cell is possible can be provided. Also, the start-up energy can be output only when it is necessary to start up the booster circuit, so that it is possible to use the start-up energy efficiently.

Please replace the paragraph at page 59, prenumbered lines 19-24, with the following rewritten paragraph:

The feature of this embodiment, i.e., the configuration in which the start-up energy is output based on the start-up signal output from the ~~fuel etc. supply~~ detecting unit and a control whether to allow either the start-up energy or the operation energy to be output to the booster circuit is performed can be applied to the eighth and ninth embodiments with similar effects as those of the eleventh embodiment.

Please replace the paragraph at page 60, prenumbered lines 9-18, with the following rewritten paragraph:

Fig. 17 is a block diagram of a configuration of a booster according to a twelfth embodiment of the present invention. The booster is configured in such a manner that in the configuration according to the eleventh embodiment as shown in Fig. ~~[[17]]~~ 16, the start-up signal to be output to the switching unit 27 is output as follows. That is, a power generation request signal to be given to control valves 42 and 43 for controlling fuel and oxygen (air), respectively, supplied to the fuel cell 21 is output through a signal delay circuit 28 as the start-up signal. Other configurations are the same as or equivalent to those shown in Fig. 16 and the same reference numerals designate those portions.

Please replace the paragraph at page 66, prenumbered line 21, to page 67, prenumbered line 8, with the following rewritten paragraph:

Fig. 20 is a schematic for explaining a circuit configuration and a principle of operation of a charge pump type. V_{dd} designates a direct current voltage and corresponds to the low voltage output that is output by the power generating element 20 shown in Fig. 18. Reference symbols SW_{31} to SW_{35} and SW_{41} to SW_{48} designate switching elements of a MOSFET or the like and controlled to either one of a state of ON and a state of OFF by, for example, a controller circuit not shown. Capacitors C_{11} to C_{15} ~~C_{31} to C_{35}~~ are storage elements for storing charge. In particular, the capacitor C_{15} ~~C_{35}~~ is a storage element that stores start-up energy (output of the auxiliary booster circuit) for starting up the booster circuit 12. The charged pump type circuits, like the switched capacitor type circuits, can be constituted by capacitors and switching elements alone.

Please replace the paragraph at page 67, prenumbered lines 9-21, with the following rewritten paragraph:

Referring to Fig. 20, the operation of the charged pump type circuit is explained. In the state shown in the upper part of Fig. 20, SW_{31} , SW_{33} , and SW_{35} are in a state of ON and SW_{32} and SW_{34} are in a state of OFF. On the other hand, SW_{41} , SW_{44} , SW_{45} , and SW_{48} are in a state of ON while SW_{42} , SW_{43} , SW_{46} , and SW_{47} are in a state of OFF. The capacitor C_{31} is charged (charge is accumulated) to approximately a voltage of V_{dd} and a potential V_1 on the upper end of the capacitor C_{31} becomes approximately V_{dd} . As will be apparent in the subsequent operation, the capacitors C_{32} , C_{33} , and C_{34} are charged to voltages of approximately $2V_{dd}$, $3V_{dd}$, and $4V_{dd}$, respectively, so that potentials V_2 , V_3 , V_4 , and V_5 of the respective upper ends of the capacitors C_{32} , C_{33} , C_{34} and C_{35} become approximately $3V_{dd}$, $4V_{dd}$, $5V_{dd}$, and $5V_{dd}$, as shown in Fig. 20.

Please replace the paragraph at page 67, prenumbered line 22, to page 68, prenumbered line 7, with the following rewritten paragraph:

When all the states of the switching elements are reversed from this state, the states as shown in the middle part of Fig. 20 appears. On this occasion, ~~as for the potential V_1 on the upper end of the capacitor C_{31}~~ since SW_{42} is in a state of ON, and SW_{32} and SW_{43} are in a state of ON, the capacitor C_{32} ~~C_{31}~~ is charged up to approximately $2V_{dd}$, so that the potential V_2 on the upper end of the capacitor C_{32} becomes approximately $2V_{dd}$. That is, transition of the state in the upper part of Fig. 20 to the state in the middle part of Fig. 20 results in transfer of the charge from the first stage (capacitor C_{31}) to the second stage (capacitor C_{32}). This relationship is the same also between the third stage (capacitor C_{33}) and the fourth stage (capacitor C_{34}).

Please replace the paragraph at page 72, prenumbered line 25, to page 73, prenumbered line 10, with the following rewritten paragraph:

Fig. 23 is a diagram of a configuration that includes a constant voltage element (Zener diode) as one example of the output controller circuit 16a. Fig. 24 is a diagram of a configuration that includes a constant voltage element 61 (Zener diode) and a constant current element 62 as one example of the output controller circuit ~~46~~ 16a. As shown in Figs. 22 and 23, a constant voltage output or a constant current output can be easily generated so that a booster having an output control function can be realized at low cost and in a compact form. As another configuration of the output controller circuit ~~46~~ 16a, a 3-terminal series regulator or the like may be used. This increases the stability of the output voltage.

Please replace the paragraph at page 75, prenumbered line 22, to page 76, prenumbered line 5, with the following rewritten paragraph:

Fig. 27 is a diagram of a configuration of a booster according to a seventeenth embodiment of the present invention. The booster depicted in Fig. 27 is configured in such a manner that in the booster according to the fifteenth embodiment shown in Fig. 22, a control signal is transmitted from the output control circuit ~~46~~ 16a to the booster circuit 12 to make the boosting capability variable, thereby achieving a control objective. Other configurations are the same as or equivalent to those of the fifteenth embodiment and the same reference numerals as those shown in Fig. 22 designate those portions.

Please replace the paragraph at page 76, prenumbered lines 6-20, with the following rewritten paragraph:

Referring to Fig. 27, the operation of this booster circuit is explained. The booster circuit 12 receives start-up energy from the auxiliary booster circuit 13 and starts up. In this

point in time, no boosted output is generated or a boosted output does not reach the minimum operation voltage of the output controller circuit ~~46~~ 16a. Therefore, in this point in time, no control signal from the output controller circuit ~~46~~ 16a is present or an unstable control signal is present. For this reason, there is a fear that the booster circuit 12 that has come to start up will stop due to an undesirable state of the control signal, thus failing to operate normally. To solve this problem, a circuit configuration having the following characteristics must be adopted.

(1) At the time of start-up, an unstable control output is not given to the booster circuit 12 from the output controller circuit 16a.

(2) At the time of start-up, the control signal output terminal of the output controller circuit 16a is at a high impedance.

Please replace the paragraph at page 78, prenumbered lines 12-21, with the following rewritten paragraph:

In Fig. 28, the booster circuit 12 receives either one of the start-up energy from the auxiliary booster circuit 13 and the start-up energy from the storage element 58 and starts up. In the selector circuit 70 provided with the rectifiers 72 and 73, one of the output voltage of the auxiliary booster circuit 13 and the output voltage of the storage element 58, which is higher, is selected and output to the booster circuit 12. After the start-up, the booster circuit 12 supplies a predetermined boosted output to, for example, a load (not shown). A part of the boosted output is stored in the storage element 58 through the rectifier element ~~24~~ 68 as energy for restarting the booster circuit 12.

Please replace the paragraph at page 80, prenumbered lines 6-14, with the following rewritten paragraph:

Fig. 29 is a diagram of a configuration of a booster according to a nineteenth embodiment of the present invention. The booster has a configuration that additionally includes, in the configuration according to the thirteenth embodiment shown in Fig. 18, a voltage judging part 82a that controls timing in which the auxiliary booster circuit outputs based on an output value (voltage) of an output of the auxiliary booster circuit output to the booster circuit 12 and a switching part 83a. Other configurations are the same as or equivalent to those of the thirteenth embodiment shown in Fig. 18 and the same reference numerals designate those portions.

Please replace the paragraph at page 83, prenumbered lines 9-17, with the following rewritten paragraph:

Fig. 30 is a diagram of a configuration of a booster according to a twentieth embodiment of the present invention. The booster depicted in Fig. 30 is configured in such a manner that instead of the voltage judging part 82a and the switching part 83a, a voltage judging part 82b and a switching part 83b that have similar functions as those of the voltage judging part 82a and the switching part 83a, respectively, are provided. Other configurations are the same as or equivalent to those of the nineteenth embodiment shown in Fig. 29 and the same reference numerals designate those portions.

Please replace the paragraph at page 83, prenumbered line 21, to page 84, prenumbered line 7, with the following rewritten paragraph:

The voltage judging part 82b includes a resistor, a capacitor ~~50~~ 90, Darlington-connected transistors 91 and 92, and so on and when a stored voltage that is stored in the

capacitor in the last stage in the auxiliary booster circuit 13 exceeds V_{BE} (that is approximately equal to 1.2 V) of the Darlington-connected transistors 91 and 92, a switching element 93 in the switching part 83b becomes conducting, so that start-up energy is supplied to the booster circuit 12. Although the voltage judging part 82b includes the Darlington-connected transistors 91 and 92, the present invention is not limited to this connection and a configuration in which a resistor, a rectifier element and so on are combined and a voltage drop that occurs in the rectifier element is utilized may also be used.

Please delete the Abstract at page 98, lines 1-8, in its entirety and insert therefor the following substitute Abstract on a separate sheet as follows: